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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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09/917,545

07/27/2001

Matthew Robert Cole Atkinson

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EXAMINER

ROSARIO-VASQUEZ, DENNIS

ART UNIT

PAPER NUMBER

2621

DATE MAILED: 06/08/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/917,545

Applicant(s)

ATKINSON, MATTHEW ROBERT  
COLE

Examiner

Dennis Rosario-Vasquez

Art Unit

2621

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 27 July 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-96 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6, 26, 33-38, 58, 65-70 and 90 is/are rejected.
- 7) ☒ Claim(s) 7-25, 27-32, 39-57, 59-64, 71-89, 91-96 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07/27/2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 2.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Objections*

1. The following quotations of 37 CFR § 1.75(a) is the basis of objection:
  - (a) The specification must conclude with a claim particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention or discovery.
2. Claims 14,15,47,48,64,78,79 are objected to under 37 CFR § 1.75(a) as failing to particularly point out and distinctly claim the subject matter which the applicant regards as his invention or discovery.

Claims 14 and 15 are referring to claim 11; however claims 14 and 15 are directed towards the subject matter of claim 13. Therefore claims 14 and 15 ought to be amended to depend from claim 13.

Claims 47 and 48 are referring to claim 43; however claims 47 and 48 are directed towards the subject matter of claim 45. Therefore claims 47 and 48 ought to be amended to depend from claim 45.

Claim 64 is a method claim that depends on system claim 57. Claim 64 should be amended to reads "A system of thresholding" instead of "A method of thresholding".

Claims 78 and 79 are referring to claim 75; however claims 78 and 79 are directed towards the subject matter of claim 77. Therefore claims 78 and 79 ought to be amended to depend from claim 77.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1,2,3,4,6 and 26 are rejected under 35 U.S.C. 102(b) as being anticipated by Ito et al. (US Patent 5,506,917 A).

Regarding claim 1, Ito et al. discloses a method (fig. 7) of determining an optimal threshold value (t sub. o) or (Figure 7, num. 213: "CALCULATE ZERO-CROSS POINT") for an image (Figure 7, num. 201:"ENTER INPUT IMAGE"), said method comprising the steps of:

- a) obtaining an image (Fig. 7, num. 201);
- b) selecting a test segment of said image (Figure 7, num. 202 uses a sliding window that computes values from the image. Also see Figure 2B where a test segment 10 is shown.);
- c) determining the mean feature size (S) of features (Fig. 7, num. 203: "CALCULATE MEAN CONCENTRATION WITHIN WINDOW". Ito's "concentration" corresponds to a mean pattern size (AH in Figure 2B) and a mean background size (AL in Figure 2B).) appearing in said test segment of said image at each of a plurality of threshold values (th sub. H and th sub. L) (Figure 7, numerals 204 and 206 are thresholds for high and low concentration areas.), so as to produce mean feature size

data (S(t)) (Figure 7, numerals 205 and 207 are values that are either high or low concentration areas based on a mean value, respectively.);

d) selecting a subset of the mean feature size data (Fig.7, num. 210 selects the data in the two window positions (i.e., a subset), where the mean concentration (i.e. mean feature size data) is greater than (th sub. H) and less than (th sub. L). See discussion at col. 8, line 56 through col. 9, line 9.); and

e) determining an optimal threshold value (t sub. o) or (Figure 7, num. 213: "CALCULATE ZERO-CROSS POINT". A threshold is calculated as per the discussion at col. 9, lines 15-19.) as a function (Fig. 7, num. 212 calculates a difference using the data of the two selected window positions.) of said subset of mean feature size data.

Regarding claim 2, Ito et al. discloses the method according to claim 1, wherein, in step e), said function of said subset of mean feature size data results in an optimal threshold value (calculated at step 213 in figure 7) equal to or approximating a midpoint (Fig. 5 shows the function as a difference between figures 4(A) and 4(B). Note that the zero-crossing point of the concentration axis in the x direction of figure 5 is approximately at the midpoint of a hill (left side of figure 5 or low concentration data) and a valley (right side of figure 5 or high concentration data).) of said subset of mean feature size data. A similar approximate mid-point is shown in figure 12 of Ito et al.

Regarding claim 3, Ito et al. discloses the method according to claim 1, wherein, in step e), said optimal threshold value ( $t_{sub. o}$ ) is taken as the weighted average threshold value ( $t$ ) (Ito et al. states, "...the zero-cross point may be determined after the curve for the histogram difference is approximated by using such a curve approximation method as a moving average...(col. 8, lines 10-13).") appearing in said subset of mean feature size data, weighted ("approximated") according to mean feature size ( $S(t)$ ) or "concentration".

Regarding claim 4, Ito et al. discloses the method according to claim 1, wherein, in step d), said subset of the mean feature size data (Figure 7, numeral 207 contains the low concentration data) and (Figure 7, numeral 205 contains the high concentration data) contains less than all of the mean feature size data. (Note that in Ito the concentration is calculated within many windows but the data in only two windows are selected.)

Regarding claim 6, Ito discloses the method according to claim 1, additionally comprising the steps of:

f) counting the number of features ( $N$ ) appearing (Figure 7, num. 211: "CALCULATE CONCENTRATION HISTOGRAMS" is depicted in figure 3(A) and 3(B). Note that both figures have a "NUMBER OF OCCURRENCE" axis corresponding to a "CONCENTRATION" axis.) in said test segment of said image at each of a plurality of threshold values ( $t_{sub. L}$ ,  $t_{sub. H}$ ), so as to produce a counting data ( $N(t)$ ) (The output of figure 211 produces a counting data based on a histogram that determines the number of occurrences.).

g) selecting a subset of the mean feature size data (S(t)) as a function of said counting data (N(t)) (Addressed in claim 1).

Regarding claim 26, Ito et al. discloses a method of thresholding an image comprising the method of claim 1, additionally comprising the step of:

j) obtaining a binary image by thresholding said image by use of said optimal threshold value (Note that the threshold value calculated in zero crossing point step 213 in Ito is used to segment the image into pattern and background portions, thereby producing a binary image as claimed).

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 5, 33, 34, 35, 36, 37, 38, 58, 65, 66, 67, 68, 69, 70, 90 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito et al. (US Patent 5,506,917 A) in view of Beato (US Patent 5,048,096 A).

Regarding claim 5, Ito et al. teaches the method according to claim 1, wherein, in step d), said subset of the mean feature size data contains all of the mean feature size data values (Fig. 3 (A) and 3(B), label: "NUMBER OF OCCURRENCE vs. CONCENTRATION" is a graphical depiction of the mean feature size data.) for which S(t) (or the graphs of "NUMBER OF OCCURRENCE (S(t)) vs. CONCENTRATION (t)") varies using the variance ( $\sigma$  super script 2) from the maximum

value (d sub. L of figures 3(A) and 3(B)) of S (or "NUMBER OF OCCURRENCE") observed in the mean feature size data (S sub. Max or the "NUMBER OF OCCURRENCE" value that corresponds to the CONCENTRATION at either (d sub. L) or (d sub. H) at col. 6, lines 51-58.

Ito et al. does not teach containing mean feature size data (or "NUMBER OF OCCURRENCE vs. CONCENTRATION" of figure 3(A) and 3(B)) for which S(t) is greater than 1% of the maximum value (d sub. L of figure 3(A) and 3(B)) of S (or "NUMBER OF OCCURRENCE" of figure 3(A) and 3(B)).

However, Beato, in the field of endeavor of bi-tonal image correction, teaches the method according to claim 1, wherein, in step d), said subset of the feature size data (Beato, fig. 2, the subset of feature size data corresponds with the portion below the line graph 200.) contains all of the mean feature size data for which S(t) (or run length above "threshold" on the vertical axis or above the line graph 200) is greater than 1% (or fig.2, label:"35%" corresponds with the "THRESHOLD" of the vertical axis and line graph 200. If 35% is exceeded by another percent, then the corresponding threshold is exceeded by the other percent above the line graph 200.) of the maximum value of S (The maximum value of S or the run length corresponds to the "THRESHOLD" of the vertical axis of figure 2. Thus, if the runlength exceeds the threshold, then the runlength is considered as "background to be removed" (Beato, figure 2).) observed in the mean feature size data (S sub. Max).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the variance ( $\sigma$  supercript 2) of the maximum value (d sub. L) of Ito et al. with the threshold teaching of Beato, because Beato's threshold teaching is useful for removing dashed lines, random straight lines, and bi-tonal graphical image patterns. Thus, Ito et al.'s images can be corrected using Beato's threshold.

Regarding claim 33, Ito et al. does not teach a system for an image and teaches the remaining limitations as addressed in claim 1, but does suggest a computer system for processing images at col. 1, lines 19-22.

However, Beato does teach a system (figure 3) for an image comprising:

- i) an image device (figure 3, num. 300) for providing a digitized image (fig. 3, num. 300 stores images and provides images to the system of figure 3 as depicted by the directions of the arrows of numeral 300);
- ii) a data storage device (fig. 3, num. 300); and
- iii) a central processing unit (fig. 3, num. 308:"IMAGE STORE CPU") for receiving the digitized image from the image device(IMAGE STORE CPU receives the digitized image from the IMAGE STORE via numerals 312,314,304,306,302) and which can write to (The output arrow of figure 308 is a write function to the IMAGE STORE.) and read from the data storage device (The input arrow of IMAGE STORE CPU coupled to numeral 302 is an arrow that reads data from the IMAGE STORE 300 via numerals 312,314,304,306,302.).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the teaching of Ito's computer for processing images with Beato's system of figure 3, because Beato's system of figure 3, num. 300 or figure 1, num. 100 (col. 6, lines 48-51) is "well known in the art (col. 4, lines 31-33)." and any computer system that processes images as in Ito would most certainly have an imaging device for entering the input image (201 in Fig. 7 of Ito), have a data storage device for storing the image data and have a central processing unit for carrying out the image processing.

Claims 34,66 have been addressed in claim 2.

Claims 35,67 have been addressed in claim 3.

Claims 36,68 have been addressed in claim 4.

Claims 37,69 have been addressed in claim 5.

Claims 38,70 have been addressed in claim 6.

Claims 58,90 have been addressed in claim 26.

Regarding claim 65, the combination of Beato and Ito et al. teaches all the limitations as addressed in claim 1 and data storage media "...memory of a computer...(Beato, col. 12, line 57-59)" having recorded thereon software "...computer program written in "c" language...(Beato, col. 12, lines 54-56) " that upon installation in a computer and execution of the software will cause the computer to carry out a method of determining an optimal threshold value ( $t_{sub. o}$ ) for an image (addressed in claim 1), (Beato uses a computer's memory for executing of the software or computer program (Beato, col. 12, lines 54-64).).

***Allowable Subject Matter***

7. Claims 7-25,27-32,39-57,59-64,71-89,91-96 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims, and the respective claim objections of paragraph 2 are overcome.

8. The following is a statement of reasons for the indication of allowable subject matter:

Claims 7, 39, 71 are allowed for determining a threshold value based on a plurality of threshold values that were determined based on a count of features. The prior art does not disclose or suggest such a feature.

***Conclusion***

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Callway (US Patent 6,075,574 A) is pertinent as teaching a method of using a percentage threshold (Fig. 3, num. 98: "brightness threshold") based upon a peak percentage measurement (Fig. 3, label: "100% brightness").

Fujiwara (US Patent 5,805,723 A) is pertinent as teaching a method of determining a density range between two thresholds (Figure 9, labels: "B" and "BL").

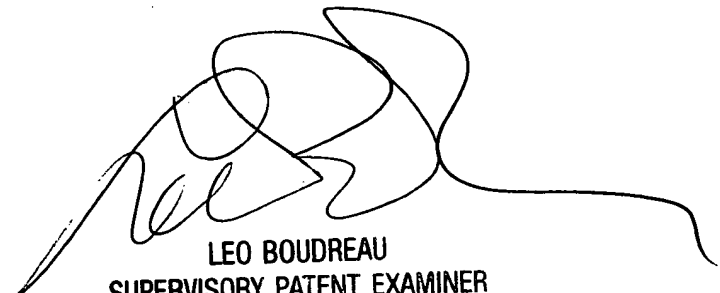
10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dennis Rosario-Vasquez whose telephone number is 703-305-5431. The examiner can normally be reached on 9-5.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo Boudreau can be reached on 703-305-4706. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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